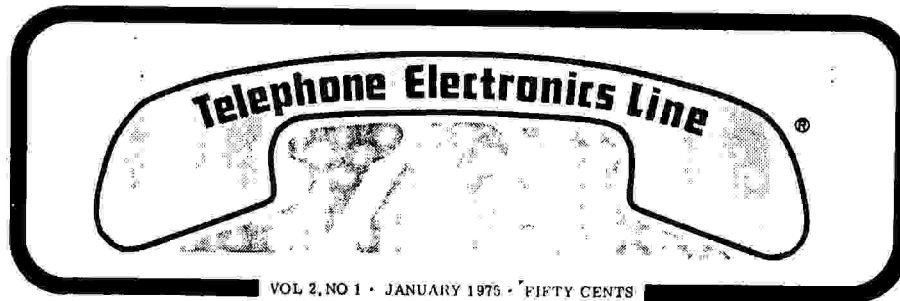


THE INTRICACY OF CREDIT CARD FRAUD



NEW YEAR '75

**MODERN
PHONE PHREAKING:**
More sophisticated
yet more vulnerable

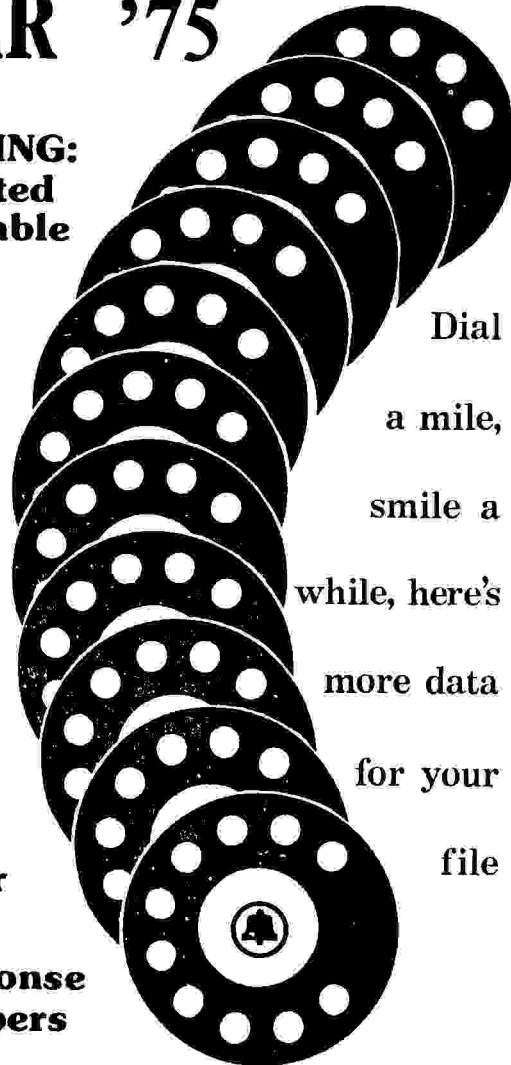
DETECTION:
How to avoid it

TOLL:
A general
introduction

**CONSTRUCTION
PROJECT:**
The Hold Button

AREA CODE 900:
It's more than a
mass calling number

**PLUS: Reader Response
Code & Test Numbers**



Dial

a mile,

smile a

while, here's

more data

for your

file



Published Monthly

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The Old Tel

We continue to grow with your support. In fact, we'll be expanding in volume 33% by next issue. In addition, you will enjoy following the multi-color diagrams, and larger cleaner type. We ask that you become an agent for TEL and sell a subscription to someone you know!



Wishes You A Happy New Year

If it's TEL, it's swell!

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Telephone Electronics Line

Editorial

Commercial Telephone Service (CTS) is a new concept which works very much in the same manner that television in America does. (As far as basic format is concerned). There are numerous opinions involved—both pro and con—however, at the present time, little has been done to design or develop such a system.

Imagine if CTS were employed in your city. There would be no telephone installation charges, repair charges, or toll charges. If CTS were employed nationwide, there would be plenty of free unlimited communication for all. Every telephone call would have an announcement that would "appear" on the conversation, sponsored by a local merchant. Your local calls would have local announcements, while toll or long-distance calls might be sponsored by National Airlines or Coca Cola.

Sound absurd? Not really. This concept has probably been employed by all telephone companies in the past, without success. The lack of interest with larger companies is why they watch. Answered by television, you will find that most stations are sponsored by local merchants for five or ten minutes. Depending on the station and the program, programs sponsored by these merchants may range from very entertaining and amusing to extremely dull and frustrating. Personally, I find most television shows are a waste of time and very non-educational. The occasional "specials" are the only worthwhile programs to view. (This is not an endorsement to degrade America's television and is not intended to do so).

On the other hand, the commercials may very well be another story. They inform the television viewer on current product availability and economic situations. They demonstrate advertising techniques and consumer gullibility. In addition, they bore the hell out of some socked-out souls who try to watch the program between commercials.

Now, if advertising were employed in the telephone industry as presently done with television, what effects would there be on the consumer and what changes would be made in the system?

In the first place, the consumer is already blessed with commercials on television. Why would it be so difficult to connect the telephone to the television? In addition, there would be no invasion of privacy on the conversation since the advertisement would be a recorded announcement played through individual couplers into each line separately. In addition, many different announcements (one recorded right after the previous one) on a continuous loop of time would be used, preventing the same message from being played over and over again.

The mechanical workings of such a system would not be difficult to employ. One idea would consist of the following: Every subscriber line would have a step-up transformer connected to the Tip and Ring terminals—the two wires which constitute a telephone line. This will permit low-level audio signals from the announcement machine to be stepped-up to a higher voltage and placed across the line. Since the telephone line is current limited, a high voltage signal will produce a loud, clear audio transmission. It will also step-down

By Jack Kravak signals that the subscriber produces, such as conversation or Touch Tone signals, travelling in the opposite direction (coming from the line and going into the announcement machine) to a level where it will be lost in the transformers. Although to a certain extent, this would be impossible according to formulas and theory, practical limitations will permit this type of setup to work. (Many audiotapes will testify to this when they find that their high-fidelity amplifier has a reduced bass response and a lack of treble. The blame: Their amplifier uses transformers which provide a lack of efficient coupling, and consequently have a loss in transmission).

Therefore, we learn that transformers placed across every subscriber line will couple the line to the announcement machine with good results. It will also block signals creeping back into the system and isolate the lines from themselves where no crosstalk or backtalk will be heard.

Two modifications that might prove to be advantageous are: 1) Using individual amplifiers on each line instead of transformers where cost is not a factor. This will provide maximum coupling and individual gain and output control for varied subscriber loop lengths. 2) Using either the transformers or amplifiers on line-link or trunk-link circuits instead of on each subscriber line. This too, is a cost factor which must be taken into consideration. It would cost less to have one coupling device on each line-link or trunk-link circuit rather than on each subscriber line. Since the line-link or trunk-link circuits link calling parties to called parties, when all of these circuits are busy, there would be no facilities to connect anyone together anyway. By placing the couplers to these circuits, the announcement will go to the actual connection rather than wait on a vacant subscriber line until someone uses the phone.

There are a few limitations that CTS would introduce into the industry. Probably the most noticeable of these would put many keypunch operators out of a good job. The only billing that would be necessary is to the few advertisers who are having their placements played on the lines. The telephone company would have to have a ready calculator truck usage for various planning and load-balancing purposes. This same equipment could be used to be saved by sending at least one First Class piece of mail to each customer each month would total a considerable fortune.

Statistically, if the telephone companies were set up for CTS in the first place, based on present operating costs, there would be no need of a financial burden in operating this system than our old subscriber billing system. Again, this calculation would be derived from current expenditures on the existing system and those predicted in CTS. No actual figures will be released in this case since this is a hypothetical system. However, it is relative to any workable telephone network. And, it is interesting to see such a system in operation. It is not often that you can see a normally watch on television on the telephone. Remember, the next best thing to being there in person is talking on the phone by long distance, whether it is courtesy of National Airlines, Coca Cola, or Ma Bell.

TOLL: A GENERAL INTRODUCTION

By Robert Klien

In recent issues, Traffic Service Position Systems have been explored and outlined in great detail.

Now, I will attempt to outline the operations of the toll operating offices.

The physical layout of the board is best explained by referring you to Vol. 1, No. 1 of TEL (Nov. '74). A picture within that Tel issue depicts the toll board quite accurately. On each toll board, there are rows upon rows of jacks. These are called "strips" and are identified by their purpose such as a 34 tandem strip, a directory assistance strip, a no-test strip, etc. The strips are physically identified on the board by small paper strips covered with plastic in special in-laid strip holders directly above the actual jack bank. They are usually color-coded to purpose, priority, and actual function. There are also small light indicators between label strips and jack banks in the form of round lights and bar lights. The bar lights are usually used for long-distance purposes. These lights, in the form of thin vertical strips over each individual numbered trunk, are computer-controlled to indicate which trunks are available for use. An operator will plug her cord into a lighted trunk before trying an unlighted circuit.

The other lights are round and usually used on incoming trunk circuits, such as coin, residential, etc. They light whenever someone picks up this phone and dials the operator. These lights are usually white.

The operator has a series of cords on her board for plugging traffic and verification purposes. Each cord "set" consists of a front cord, a back cord, and two lights to indicate call status for whatever circuit that particular cord "set" is plugged into. Typically, an operator's board would have 20 such sets. For usual identification purposes, each cord set is marked by color. From the left, the first cord set would be rodded with silver cords, white plugs, and white indicator lights. The subsequent set would have red cords, red plugs, and red indicator lights. The cords are long enough to stretch easily to the farthest jack and weighted with a special pulley arrangement to allow easy and fast retraction. The cord set, in idle position, rests with both plugs straight up. The helix for the cords are only large enough to accommodate the cord itself. The plugs rest snugly against the smaller hole, held by the weight arrangement. Additionally, each cord set is provided with 2 or 3 keys, of double pole, double throw on-off switches, used for applying ringing voltage to the front or back cords, applying talk voltage, or opening the circuit to the MF keyer for dialing on the front or back cord. Each operator is also provided with a special multifrequency keyer, which dials on trunk circuits in a method similar to our touch tone dials.

When a residential customer dials operator, a light goes on all the toll boards, on the incoming toll strip, which is identified further by a small strip denoting the first 3 digits of the customer calling such as 870, 876. An operator who is not actively engaged in a call will take her back cord and plug it into the lighted jack. While the customer waits for the operator, an audible ring-tone is sent to the customer to tell him that his call is going through.

When the operator plugs in, the light goes out on the board and the light representing the back cord stays off, while the light for the front cord goes on. The customer's phone is off the book, while the front cord is still hung-up, it isn't con-

nected. The light is on when the phone is on the hook, off when it is off the hook.

After she plugs in, the operator will flip a key that applies talk voltage through that circuit to her headset apparatus. When the operator answers, the customer specifies the type of call or assistance needed and the operator responds accordingly.

A typical situation is: a customer claims that he has dialed a long-distance number 4 or 5 times and cannot reach the party. The operator asks for the number he is calling and the one he is calling from. She writes this information on a traffic routing ticket. Since the tickets are read electronically into billing computers at special billing centers, the operator will also mark "odd" which means he will be charged for a direct distance call. She locates the appropriate trunk strip, and a trunk marked by a thin vertical light indicator, and plugs her front cord into that circuit. The light turns on. MF activation key, which opens a circuit from that particular cord set to the MF key unit, and depresses the MF key. A light marked ST lights to indicate that further keying can be initiated. The operator then depresses numbered keys on the MF unit, dialing the number she is to connect. After she completes the ten digits she depresses the key marked ST which initiates completion of call to the far end. The light on the keying unit (ST) will go out. The light on the cord set for the front cord will stay lighted until the far end answers and then goes (reverses). If the number called is a special rate (Telephone Company), the light on the cord set will stay lighted even though the ringback tone is stopped, the call answered, and conversation is going on. Operators call a line that has supervised "dark supervision" (light supervision). The operator (in a normal reversed call) will note when her front light goes out (to indicate call completion) and pull her special timer lever on her calculator timer mechanism which marks the time at present on the ticket, and proceeds to another call.

On 3rd party calls (calls billed to a 3rd number) the operator, after dialing the required number will call that third number to obtain billing verification. If that number is busy she will write "BY-3" on her ticket. If that number rings, but does not answer she will put "DA3" on the ticket. In either of the above cases, she will allow the call to go through unopposed. If that 3rd party answers, she will ask the answering party if they will accept the billing on a call being placed now, charged to that number and initiated by Mr. so and so.

If the party says that it's all right, she will put "V-3" on her ticket and proceed with another call, after timing that tick-recording, such as a disconnected number, she will interrupt the call, split the parties, and ask the customer for the 3rd number again. If it is the same number, she will tell him the circumstances, and try to arrange for other types of billing. If the customer is using a fraudulent name or number, she will charge the called party. If calls are billed to a 3rd number, and it is done fraudulently, that person can complain to his "Rep", who will have special agents investigate the billing. The method of investigation is to call the Customer Name And Address Bureau Office associated with the called area, and obtain the party's name whose number was dialed and billed to the 3rd number. Then, if the 3rd party is continued on page 9

Telephone Electronics Line

The intricacy of CREDIT CARD FRAUD

By Robert Klien

Due to the recent reader response, I have decided to write an article about an important facet in the telephone system by which you can do as well as observe. Namely: CREDIT CARD FRAUD.

The title, "CREDIT CARD FRAUD" is used to indicate that misusing credit cards for fraudulent purposes is illegal, a violation of section 502.7 of the California State Penal Code. I do not recommend that you use them, nor do I condone their usage. In these lines, I have omitted actual credit card numbers but have included the actual code used. None of the credit card numbers printed here are real—all are fictitious.

The letter code for 1974 was:

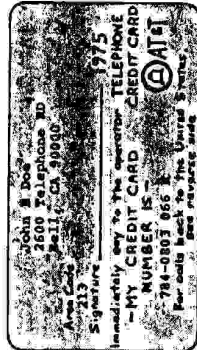
1N	6S	This means that a 1974 code of
2X	7Q	788-4444 066 would have a
3Z	8F	letter code of "N", as the 4th digit
4A	9U	is the key digit in our list.
5G	0J	

The letter code for 1975 is:

1E	6A	This means that a 1975 code of
2M	7W	788-4444 066 would have a
3U	8Z	letter code of "W", as the 4th digit
4J	9H	is the key digit in our list.
5Q	0R	

Here is the 1974-75 letters side-by-side.

NE	SA
XM	QW
ZU	FZ
AJ	UH
CQ	JR



Pictured in the above illustration is an example of a typical credit card. Note the position of the name as opposed to the 10 digit code above. I have found that pasting a cut-out of this card (above) on wallet even a quicker guide to the right answer. Note the use of the code above. The code consists of the following elements: the 7-digit telephone number of John E. Doe + a Revenue Accounting Office (RAO) code, determined by John Doe's home area code and first 3 digits of his telephone number. The RAO code currently runs from 001 to 999, RAO codes that are not within these parameters are rejected by an operator + a letter code which consists of any letter of the alphabet selected on the basis of a random, non-repeating code. Ten such letters are lined up, which are then selected on the basis of a specific key check digit in the telephone number.

A typical example of a credit card number is: 784-0803 066 R. The letter code used is a 1975 series letter, and the code is non-existing in real life, although the number is an existing one in the 213 area. Existing codes may be found by listing and # of the TEL issue, as well as the article's name, #.

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Coming Next Month:
Tone Boxes (Blue & Red)
DDD Overseas
Answering Machine Survey
Telephone Systems
Dial Speed Measuring
Phone Booth Special

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January 1975

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Modern Phone Phreaking

By Donald Simmones

From technology's standpoint, many advances have been made in today's phone system, and with these advances come advances in anti-technology, or the Phone Phreaks.

In earlier days, a "Black Box" or Mute Box, capable of allowing the user to get calls for free without charging the calling party, were widely used. Along with this, the "Blue Box", a Multifrequency Oscillating Device which reproduces the standard Bell System trunk signaling times, is capable, when used with knowledge of the correct codes, of calling anywhere in the world. An advanced Phreak can even stack trunk circuits; say all trunks between L.A. and Miami, rendering all calls between either cities incomplete. More recently the "Red Box" was introduced, capable of reproducing the sound of electronic coin drops (2200Hz) generated by the new Western Electronic single slot pay telephones (IC types).

Armed with these 3 basic devices, an average Phone Phreak can cause thousands of dollars worth of free telephone calls, interception, and endangering of communications. It is entirely feasible (and has been done) to tie up all the trunks leading into and out of an entire city such as Bakersfield in less than 45 minutes, rendering it hopeless due to lack of communications.

With more skills, and knowledge of very complex and secret codes, it is also possible to tie up all overseas circuits, satellites included, to declare secret Military conversations, or even to monitor calls to and from the White House. The ultimate would be to, with the proper frequencies and codes, put missile installations on standby alert, and activate the Conelrad Emergency Defense Systems.

Because the abilities mentioned above are so dangerous most illegal calls should be based on some elaborate precautions.

1. Tell No One that you have tools of, or are a Phone Phreak. If nobody knows about you, then you will not become suspect due to tips, rumors, and the like.
2. Do not Blue Box from your home telephone. This is too dangerous due to the advent of certain detection techniques.
3. If you Blue Box, do so from Pay Phones only. Select your pay-phones on a random basis so as not to leave a pattern as a basis for your capture.

Some very cautious Phreaks even install thermite bombs in their Blue Boxes, which, when detonated, will reduce the Box to "Metal Soup" faced with "Plastic Spices". This, no electronic components exist to be reconstructed in a lab and then used as evidence for conviction.

In any case, the Phone Phreaks can and do take advantage of each advancement in the Bell Systems elaborate technology. With every new device or service introduced by the Bell Systems, the Phone Phreaks introduce their counterpart designed to break it down. The Phreaks even have a network of Bell System employee/spies as good as or better than the Special Agents posing as Phone Phreaks. It is notable however, that Phone Phreaking becomes harder with each passing day. Rising complexity of the telephone network demands a corresponding rise in the technical competence of the Phone Phreak, a fact which tends to take it from the hands of the general public and leave the illegal stuff up to the technically skilled. In the long run, most outstanding Phone Phreaks find that crime does not pay indefinitely. *

DETECTION: How to avoid it

By David Rees

Many of you have probably read various magazine and newspaper articles about people who were caught and convicted for the fraudulent use of a Blue Box. Naturally this leads us to ask, "How were these people detected, and what methods does the Phone Company use to catch Phone Phreaks in the act?" Actually, the Telephone Company has a hard time locating and collecting enough evidence to catch and convict a Phone Phreak, and is immensely difficult. The small percentage of Blue Boxers who are caught and convicted for the most part represents those who were not cautious or careful enough when committing the act of fraud by wire.

There are three major systems of detection used by the Tel. Co. In order to stage-out the Blue Boxers from among the multitude of average telephone callers. Each method of detection will be discussed separately and a countermeasure will be suggested.

THE INFORMER

Probably the most effective and certain method of Phone Phreak detection used by the Bell System is the lack of information from a source might call a bluff, a pigeon, an informer or some other derogatory phrase. Some of the last words for Phone Phreaks are "I trust him, he would not tell anyone". Even the most trusted friends decide to inform on you under the right circumstances. It is my understanding that the Bell System's favorite tactic is to catch a Phone Phreak and they offer "immunity" if he will inform on his Phone Phreak friends. When faced with such a choice, few will "take the rap" on their own. Armed with this information, the Security Agents for the Tel. Co. write up "Black Lists" containing information on who to watch and how carefully to watch them. On this basis 2500 Hi detectors and other devices may be issued at the request of the Telephone Company.

THE 800 OVERDOSE

The Phone Company keeps a careful watch on everyone's calling records. They maintain a subroutine in the computer program which handles billing that looks for an unusually large number of 800 area code calls or 800 calls of unusual duration. When it comes across a record with these discrepancies, it is printed out with a special note to security agents. On a few occasions the Phone Company has made a computer print out of all 800 calls made from a particular number. If that number has made more than fifteen 800 calls per month, or has been connected to an 800 number for periods of time longer than 15 minutes each. The most effective remedy for this method of detection is to make all Blue Box calls from pay-telephones. However, if you are set on making calls from your home phone, you should meet certain guidelines. Do not make too many Blue Box calls, or any of long duration. If you reach the very low rate associated with it and Blue Box off of it. Though it is not free, a call to New York from Los Angeles at Los Angeles to Anaheim rates represents quite a savings.

TROUBLE LOCATING EQUIPMENT

In most end offices and especially in major toll centers and long haul trunk facilities, there exists automatic trouble

Interested students, all the way down to the Junior High School level, knowledge of the science of electricity is a must. You see the development of new ideas and new pieces of equipment which will work in conjunction with the telephone system. These developments should be taking place in a spirit of full cooperation and should serve to greatly increase usage of the system. Much more so during the winter months when many phone companies callously begin to drop many long distance calls, creating many new business and job opportunities for a great many people. This could do much to help this country get out of its present economic situation, helping to create many more hard-working taxpayers to help our Uncle Sam carry his present burden. I am hoping you can give my ideas some thought, as I am sure some of the top-level management in the phone system read it also.

James A Davis
Philadelphia, PA 19120

Dear James,

You have an excellent idea. The current situation with Telephone Company rules and regulations still stands where it stood years ago, nowhere as far as the customer is concerned. When you have brought to our attention, and made it clear that you would make new opportunities and ideas to develop. The Telephone Company has been too much complacent. The People's Communications media and it is up to all concerned to protest and bring to the attention of the law for this problem. After all, telephone service is for the public who should be able to use it to the fullest.

LETTERS FROM THE READER

Dear Sirs,

I am a new subscriber to TEL. I would like to contribute some information that might be newsworthy to your readers. There is a nationwide number that anyone can dial for the latest medical reports, transportation reports, news service for H.U.D., and National Dept. Of Regional Councils. These numbers are:

U.S.A.T. 1-800-424-8807
H.U.D. 1-800-424-8820
M.D.R.C. 1-800-424-8850
A.M.A. 1-800-424-8820

The above numbers are all nationwide. You can call WATS information for further reference on these numbers. The number for WATS information is 800-355-0000. Along with the H.R.C.A.M.A. changes their tapes every Monday and I don't know when H.U.D. changes theirs.

Abbreviations used in this letter:

U.S.D.T.-United States Dept. Of Transportation
H.U.D.-Housing And Urban Development
M.D.R.C.-Medical Regional Councils
A.M.A.-American Medical Association
WATS-Wide Area Telecommunication Service

Ted Harris
Potsdam, NY 13676

Gentlemen:

I am a new subscriber to your wonderful little magazine, and I am hoping that there is a way in which the pages of it can be used for what I believe should be a very constructive purpose.

You see, at the outset Thomas Edison could have taken the same attitude Bell System has taken all along concerning what they term as "foreign equipment". From the purely technical standpoint, the arguments used against interconnecting equipment with telephone lines would be far more valid than applying old time company lines of "yes, yes, yes" to this country's first effort. The number and variety of pieces of equipment which use electricity grew at a fantastic rate such that the use of electricity doubles every ten years.

The obvious result is that it made a vast number of business and job opportunities which are, today, simply an accepted part of our society, and has contributed toward the building of what has been termed the richest nation in the world. A safe and sound and a very good safety code was developed, and everything was done to disseminate as much scientific and technical information on electricity as possible to interested students, even down as far as the Junior High School level. People were encouraged to invent and develop new ideas and new businesses.

Setting forth this as an example to the telecommunications field, it is my hope that the Bell System can be persuaded to do a 180 degree turnaround and to adopt a similar philosophy: to disseminate as freely as they possibly can to

Dear Sirs,

When a relative asked to use my telephone I was not at all surprised as she was on the first leg of a very long trip. However, when she placed a person-to-person call to herself my eyebrows raised to say the least. It was soon clear that she was conveying information without it costing her a single cent. I called two children were at home. The first part of the trip and were safe at our home. They of course, told the telephone operator the called party was not at home. I soon found that a wealth of information could be conveyed in this manner providing a code of existing and non-existing names were compiled ahead of time. I would advise of a two day stopover and everybody safe and well.

A system used by High School Students was also simple but effective. Each call was placed from a pre-designated pay telephone booth. The student would dial his or her home telephone number and let the telephone ring ONLY ONCE. As virtually no telephone calls are made with one ring, the parents would know the call was from one of the pay telephone booth. The student of course was waiting to accept.

Edward V. Pellissier
Hemlock, OR 97333

AREA CODE 900

--it's not only a mass calling number

By John Reynolds

The event which highlighted the need for a special mass calling area code was the Nixon-Rumpley debate in Los Angeles. Only two telephone numbers were given on the screen to receive questions to be answered. This resulted in a very low number of completed calls to these numbers compared to the number of attempts made. A large number of callers were using circuits and reaching reorder. Area code 900 was designed to allow the customer to use as little central office equipment as possible before receiving a reorder.

Starting with the originating end office, each office directs 900 calls to two trunks. This process continues to the next higher class office until a 4A XBar machine is reached. If the terminating office is unable to handle this, four trunks from each major 4A, the number will be reduced even more. Thus, the number of available circuits can be controlled to prevent overloading the DDD network.

We have listed the prefixes and their locations along with the MF central office codes. Most of the time the access to area code 900 will be turned off and you will not get through. The charge to call a 900 number is the same as a regular number in that area code. THESE NUMBERS ARE NOT FREE! If you know of any valid numbers please send them in and we will publish them. Try everything with area code 900. Many times the circuits will route you to strange places. Recently I have received your comments about the 900 number and get the number in LA, but at no charge. This has been corrected but you can try it where you live.

CO	State	City	Bus. NPA	Actg. RAO	City	Op. H
220	IN	Indianapolis	11	317+	6272	2992
222	CA	Sacramento	15	916+	8304	8580
230	FL	Tampa	11	813-053	8173	1147
232	MD	Baltimore	11	301+	5510	1575
234	FL	Jacksonville	21	904+	7649	1276
242	DC	Washington	10	202+	5622	1583
243	NM	Albuquerque	27	505+	8549	5887
247	CA	Fresno	28	209-004	8659	8259

DETECTION continued from page 7

detection equipment. In Crossbar 5 offices and 4A toll tandem, the trouble recording equipment consists of an elaborate sensory network of wires and relays associated with all common control equipment in the office. This network is linked to a diagnostic device which punches appropriate holes in an IBM card to indicate to the switchman or office attendant the location and nature of the problem. In electronic switching offices (ESS, EAX, etc.) the central computer which controls all switching in the office is equipped with diagnostic subroutines which constantly check for various trouble conditions.

All of this weighs heavily against those who make fraudulent calls. In ESS offices, clearing a hook after forward with 2600 Hz carrier tones, repeating the same sequence of tones, "not a real" indication about that line. In addition, the "spot" the calling number as well as the called number. When noticed by a switchman this spells out trouble. In some 4A and 4M TOLL centers the equipment looks for this "spot" reversal condition on its trunks. Also indicated is the incoming trunk number which can be traced back by calling the originating office or checking tolling records at a later date.

TEL Tips

From the reader

STOP THOSE CRANK CALLERS

Build a beeper box to emit a duplicate of the telephone company's recording beeper. This beeper will freeze up when they think they are being recorded, especially storm window salesmen. Once they are off balance it is easy to either play with them or get them off your line. This is much more economical than actually recording and a lot more fun.

HOW TO MAKE YOUR OWN JACKS

Recently many phone companies switched from a square rectangular jack to a round rectangular jack. The new round boxes are almost impossible to find. There is a way however, to make your own jacks.

First, obtain a round cover plate and metal ring. These can be obtained from your repairman. The ring can be found when you moved to a new house. The cover plate can be found in the same place. The ring can be cut out of a 1/8" hollow wall anchors. Then the center is cut or drilled out with a hole saw. Make sure the anchors are flush with the wall surface before installing the ring. Now you are ready to mount the cover plate, terminal or jack.

The jack itself is made by drilling four appropriately spaced holes in the plastic cover plate. You may have to buy a surface mounted model to use as a template. Be sure that you have the correct holes on top as the many Japanese jacks are marked upside down.

Next, manufacture the contacts by winding a long spring on a heavy coat hanger or similar rod. This lig must be slightly smaller than the plug. Use as the spring will expand after winding. Spring brass wire. Wind a second spring, but in the opposite direction. These two springs will nest together and form your contact.

OPERATOR-May I have the Area Code for...

The next time you have nothing to do you can call your friendly "O" operator and ask her for the area codes of these communities. All of these exist and Ma Bell has an area code for each one.

Georgia	Florida	California
Arp	Beil	Agnew
Bail Ground	Beile Glade	Angela Camp
Camp Dixie	Camp E-chock-o-tree	Asuna
Chickamauga	Choce	Ben Hur
Climax	Cocot	Bowles
Dial	Fruitland	Bruleway
Dry Pond	Fruitville	Butte City
Experiment	Geneva	Butte City
Fairytland	Hole Sound	Erp
Fish	Holliday	Happy Camp
Fry	Kissimmee	Lucern
Gay	Little Torch Key	Mecca
Good Hoper	Old Town	Nice
Loco	Old City	Nut Tree
Meansville	St. Cloud	Oliver
Metairie	Shirley	Palmdale
North Circle	St. Francis Farm	Palmdale Pines
Palmdale	St. Francis Farm	Railroad Flat
Tramaine	Titusville	Tranquility
Ty Ty	Treasure Island	Volcano
Zenith	Venice	

Try not to get your fish and your fry or your fruitville and your fruitland confused.

Get your lengths of this tested wiring(s). Insert in a plastic straw. On either end of each contact assembly snip about 0.25 inch of wire. This will hold the spring in later steps.

Now place a commercial or telco plug through your wires. The plug should be inserted into the contact assembly and the plug should be inserted into the contact assembly and the plug should be inserted into the contact assembly.

Solder your connections directly to the spring or use Rohstock clips for quick installation and removal.

EXTRA PHONES

OK, you don't want to become an electronic whiz, you just don't want to be caught with a phone in each closet and the bathroom. The best way to get extra phones is to use a second line. This is to have a second line to your house and the second line is to have a second line to your house and the second line is to have a second line to your house.

Back to basics. If you don't want to connect a second line to your house, you can use a second line to your house. This is to have a second line to your house and the second line is to have a second line to your house.

Remember a little precaution is better than a large backcharge and possible loss of service.

TOLL continued from page 4
still doesn't know that person, they will call that party and try to find out who called at that time and date. If they do find out they will try to locate that person, and bill and/or prosecute him.

For all you phone enthusiasts, there are certain numbers that exist as test numbers for the Telephone Company that are always busy. They may be found by logistical calling and certain knowledge of Telephone Company test codes. For example, the permanent busy number is 212-XXXX-XXXX. XXX represents the first 3 digits of the X-bar or ESS area code.

The New York code will also work in most parts of N.Y.S. using different area codes and prefixes. I would suggest for one's random basis, and that you always use pay-phones, prefixes and area codes that are permanently busy. Also alter your usage of them on a random basis in conjunction with your random selection and usage of pay phones. If a random pattern is produced, even in times called, the Phone Company will be discouraged from investigating, as they have no one to talk to. The called party can always claim that they received a prank call and they leave their phone off the hook. This claim will be supported by the random nature of the calls. A last word concerning 3rd party calls, be sure to instruct your distant friend whom you are calling on how to deal with the Telephone Company.

Back Issues are available for \$1.00 each. Unpublished material, including advertising, is available for \$2.00. sent by first class mail in a manila envelope. Specify 30% (TSPS) or Dec. (Toll fraud) copy.

Construction Project

By Jack Kranyak

THE HOLD BUTTON

INTRODUCTION

Have you ever attempted to run across the house and answer the telephone before the calling party disconnects. This will undoubtedly happen when someone calls, you answer the phone and wish to speak on another phone in the privacy of your own bedroom. You have a choice of telling the calling party to hold on while you dash across the house and answer the extension and dash back to hang-up the first phone and dash a third time to speak with your party. Or, you can hang up the first phone and dash just once to the extension phone and answer it within fifteen seconds. (Most phone companies provide the called party with fifteen seconds of "reset" or "time-out" time after the phone is answered. Therefore you will probably notice that you can "hang-up" on your friend for as long as fifteen seconds and he will still be at the other end when you answer again.) This can, at times, be very annoying if you have a large home and your extension phone is in the tree house out back. In addition, if you have an office with the same problem, it would be a poor idea to go darting and dashing through the corridors to answer the other phone all out of breath, hoping your client is still on the line!

SOLUTION: Call up your local telephone company business office and request a key-phone installation with hold features. Of course, you will want lines that indicate who is on hold. The approximate time for such an installation to be ordered and installed may be as much as three or four weeks.

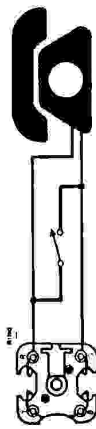
ANOTHER SOLUTION: Build one yourself. It will provide you with four accomplishments: a savings in time, a savings in cost, a knowledge of the telephone system, and the personal satisfaction you will get from doing it yourself. Take the time to mention our new book at all of your next telephone calls. It will save you as much as \$250.00 to install it! You will learn what key-installers take a trainee course for six months to learn, in one evening, and you will have the ambition to go on to bigger and better things.

CIRCUIT DESIGN

Consider the telephone circuit. The telephone is connected to the line by two conductors:



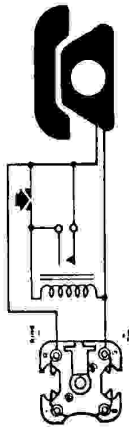
If you were to have a hold button in the circuit, it would look like this:



This type of hold circuit is by far, the simplest and easiest to install. It will put the party on hold when the switch is closed and take the party off hold when the switch is open. When the switch is in the hold position, the telephone may be hung up and the party on the other end will not disappear.

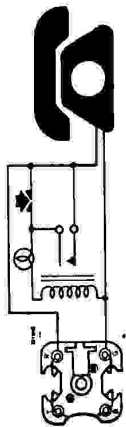
ITS DEADEND: You cannot operate the hold button from a remote location. You must have a hold button at every location you wish to activate the hold from. And all hold switches must be turned off to take a party off hold. This means that you still must run around the house flipping all the hold

switches that are on, to the "off" position in order to hang up and dial another number. This is the disadvantage that this particular hold button has, and may be corrected by employing the following circuit:



This circuit works on the principle that the 48 volts normally found on the telephone line will hold the relay down, thus holding the line, until the telephone instrument is answered, consequently robbing the relay circuit from sufficient power to be held down. It's a simple circuit and found to be quite effective. A separate hold may be installed at every location where holding features are required. One thing to remember: this type of hold operates on a voltage-sensitive system. (I.E. the voltage drop across the line when the telephone becomes off-hook and requires more power is insufficient to keep the hold relay down). Consequently, if there are excessive loads present on the line, or if too many lines are activated on the same line at once, the hold relay(s) will open.

If the party that calls you is placed on hold, becomes impatient and hangs up, the hold relay will burn off automatically fifteen seconds after the calling party hangs up. Your telephone will be in a normal condition ready for standard operation. If lamps are desired to indicate when a party is on hold, the following circuit will provide this option:



Be sure that a lamp requiring very minimal current is chosen, as this too is a factor in determining relay sensitivity. Another option includes blinking lamps. There are many methods used to produce this visual signal. The Phone Company uses a device known as an interrupter. The interrupter is a microelectronic device which produces a series of pulses which turn on the incandescent relay switches. The interrupter contacts would be wired in series with the lamp.

PARTS LIST

The basic parts that are required to build the hold button are a relay, a pushbutton switch, and a lamp.

The relay may vary from the standard 600 Ohm telephone-type relay. This is due to your location on the telephone line and various line loads on your telephone. You must experiment with different relays to determine which relay will give you the best results. The relay must be capable of handling a potentiometer in series with the relay coil to adjust sensitivity. Probably most often, a 600 Ohm relay at 24 volts will do the job. Again, try experimenting with different relays until a satisfactory one is found. (A Radio Shack "Relay Surprise Pack", for example, is an excellent source of relays).

The pushbutton switch may be an SPST, momentary contact. The lamp may be any value, as long as relay operation is not affected. Usually, 2-3 volt 50ma is sufficient.

APPROXIMATE CONSTRUCTION TIME: One hour.
APPROXIMATE CONSTRUCTION COST: \$5.00.

*

TELEPHONE ELECTRONICS LINE

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now available for the telephone experimenter

COMPLETE CONSTRUCTION PLANS

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ALL OF THE CONSTRUCTION PLANS ABOVE ARE AVAILABLE FOR \$24.95. WITH "LEGAL ASPECTS" BOOK, \$49.95. TELETRONICS COMPANY OF AMERICA, 22035 Burbank Blvd., Woodland Hills CA 91364 USA

JANUARY 1975

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